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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,010	10/31/2003	Ramon Vega	200209963-1	8251

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EXAMINER

ZHU, RICHARD Z

ART UNIT	PAPER NUMBER
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2625

NOTIFICATION DATE	DELIVERY MODE
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05/12/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/697,010	Applicant(s) VEGA ET AL.	
	Examiner RICHARD Z. ZHU	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/19/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgement

1. Acknowledgement is made of applicant's amendment made on 3/19/2008. Applicant's submission filed has been entered and made of record.

Response to Applicant's Arguments

2. Applicant's arguments are persuasive. Therefore, the examiner vacates the rejection set forth in the previous office action and enters a new ground of rejection in view of the information disclosure sheet submitted on 3/19/2008.
3. The drawings filed on 3/19/2008 are accepted and the objections were withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 4-7, 10-12, 14-16, and 18 are rejected under 35 USC 103(a) as being unpatentable over *Kao et al. (US 2002/0018086 A1)* in view of *Masuyama et al (US 6871934 B2)*.

Regarding Claim 1, *Kao* discloses a method of operating a printer of the kind comprising an array of dot printing elements extending in a first direction relative to a page

to be printed (**Fig 1 and see Col 1, Rows 14-38, an array of inkjet cells extending in a first direction relative to a paper medium or page to be printed**) and which prints at least a part of the page during relative movement between the array and the page in a second direction at an angle to the first direction (**Conventionally, inkjet nozzles are arranged in one direction depending on how directions are defined on the basis of orientation of the nozzles relative to the paper medium whereas the nozzles are moved in another direction when ejecting ink on the paper medium depending on the same orientation of the nozzles relative to the paper medium**), the array comprising a plurality of groups of elements with redundancy among the elements of the group (**Col 4, Rows 56-65, the redundant group of inkjet nozzles are the nozzles that do not jet ink at the time of printing**), the method comprising, in respect of at least one of said groups, initially commencing printing using a subset of the elements in the group (**Col 4, Rows 56-65, the subset of the elements being nozzle or inkjet elements provided with the first signal**).

Kao does not disclose during the course of printing, increasing the number of elements available to print in the group.

Masuyama, in the field of printhead nozzles (**Col 4, Row 66 – Col 5, Row 8**), discloses during the course of printing, increasing the number of elements available to print in a group of nozzles (**Fig 4 and see Col 5, Row 58 – Col 6, Row 20**).

It has been suggested that in order to assure proper nozzle performance during the course of printing, it is necessary to perform preliminary ejection to remove viscous ink in order to clean nozzle interiors and make said nozzles available for printing (*Masuyama*, **Col 7, Rows 20-28**).

Therefore, it would've been obvious to one of ordinary skill in the art at the time of the invention to increase the number of elements available to print in the group of nozzles of *Kao* as suggested in order to perform preliminary ejections that place nozzles in condition for printing (*Masuyama*, Col 5, Rows 32-35 and Col 7, Rows 22-28).

Regarding Claim 2, *Kao* discloses wherein each redundant group is arranged to print a respective row of dots in the second direction (Conventionally, inkjet nozzles are arranged in one direction depending on how directions are defined on the basis of orientation of the nozzles relative to the paper medium whereas the nozzles are moved in another direction when ejecting ink on the paper medium depending on the same orientation of the nozzles relative to the paper medium).

Regarding Claim 4, *Kao* discloses wherein the number of elements in the group available to print is a function of the number of firing pulses sent to the elements of the group (Fig 5 and see Col 5, Rows 1-28, the amplitude of signal 1 is higher than signal 2. As it can be observed, the number of nozzles or inkjets available for ejecting ink is a function of signal 1. The more nozzles that receive signal 1, the more nozzles are printing).

Therefore, *Kao* as modified by *Masuyama* teaches wherein the number of elements in the group available to print is increased as a function of the number of firing pulses sent to the elements of the group because firing pulses are needed to command nozzles that had been kept out of use up to the previous scan in Fig 4 of *Masuyama* to start ejecting inks.

Regarding Claim 5, *Masuyama* discloses wherein each element newly made available to the group is initially made available for use less frequently than the existing

element(s) (**Fig 4, for example Scan Pass N+1, nozzles 1-4 had already been used 5 times when nozzles 5-7 are used only once**).

Regarding Claim 6, *Kao* discloses wherein at least one element in the group is serviced prior to printing so that it is at least partially operational at the commencement of the print job (Col 4, Rows 37-55, start to heat the nozzles in preparation for printing whereas those received signal 1 are heated to ink ejection temperature), printing being commenced using the said at least one serviced element and one non-serviced element (Col 4, Rows 56-65, serviced element being supplied with signal 1 whereas non-serviced element being supplied with signal 2), the non-serviced element initially being made available for use less frequently than the said at least one serviced element (Fig 5 and see Col 5, Rows 1-28. Inherently, for those nozzles that receive signal 1 for the first time relative to those nozzles that already received signal 1 at least once, the nozzles that had just receive signal 1 for the first time are less frequently use than the nozzles that already received signal 1 at least once).

Regarding Claim 7, *Kao* discloses prior to commencing printing, identifying portions of the array of printing elements which will be needed at least for a first pass of the array relative to the first page of the print job (Fig 5 and see Col 4, Row 66 – Col 5, Row 25, on the basis of the input print data, it is determined which nozzle or inkjet will receive signal 1 and which nozzle or inkjet will receive signal 2), and servicing printing elements according to the array portions so identified whereby one or more printing elements outside the identified array portions are not serviced (Col 4, Rows 56-65, serviced element

being supplied with signal 1 whereas non-serviced element being supplied with signal 2).

Regarding Claim 10, *Kao* discloses wherein the printer is an inkjet printer and the dot printing elements are inkjet nozzles (Fig 1 and see Col 1, Rows 14-38).

Regarding Claim 11, *Kao* discloses an incremental printer (Fig 1 and see Col 1, Rows 14-38 and Col 3, Rows 60-65) comprising a plurality of printing elements grouped into redundant groups, each group being arranged to print substantially different portions of a given page of a printjob (Inherently, inkjets at different location would corresponds to substantially different portions of any given paper medium on which printing is to be executed), the printer being adapted, when commencing a printjob, to control at least one redundant group of printing elements such that only a subset of the printing elements in that group are used to print (Col 4, Rows 56-65, the redundant group of inkjet or nozzles are those that received signal 2 whereas the subset of inkjets that are designated for printing received signal 1), the printer being further arranged to subsequently increase the number of printing elements in that group which are used to print (Col 4, Rows 56-65 and see Fig 5, Col 5, Rows 1-28, when the nozzle or inkjet elements initially provided with the second signal receives the first signal, the number of elements available to print are increased).

Regarding Claim 12, *Kao* discloses wherein each redundant group is arranged to print a row or column of image data (Col 5, Rows 1-28, row data 130 and column data 150).

Regarding Claim 14, *Kao* discloses wherein the number of elements in the subset of that group is increased in dependence upon the cumulative number of firing pulses sent to the elements of the group during the printing of the printjob (Fig 5 and see Col 5, Rows 1-28, the amplitude of signal 1 is higher than signal 2. As it can be observed, the number of nozzles or inkjets available for ejecting ink is a function of signal 1. The more nozzles that receive signal 1, the more nozzles are available for printing).

Regarding Claim 15, *Kao* discloses the printer being further arranged, when increasing the number of printing elements in subset of that group, to cause the one or more printing elements newly included in the subset to print for a predetermined duration at a frequency lower than that of one or more printing elements previously included in the subset (Fig 5 and see Col 5, Rows 1-28. Inherently, for those nozzles that receive signal 1 for the first time relative to those nozzles that already received signal 1 at least once during a predetermined duration, the nozzles that had just receive signal 1 for the first time are less frequently use than the nozzles that already received signal 1 at least once during that predetermined duration).

Regarding Claim 16, *Kao* discloses wherein at least one element in that group is serviced prior to commencing the printjob (Col 4, Rows 37-55, start to heat the nozzles in preparation for printing whereas those received signal 1 are heated to ink ejection temperature).

Regarding Claim 18, *Kao* discloses wherein the printer is an inkjet printer and the printing elements are inkjet nozzles (Fig 1 and see Col 1, Rows 14-38).

6. Claims 3, 9, 13, 17, and 19-20 are rejected under 35 USC 103(a) as being unpatentable over *Kao et al. (US 2002/0018086 A1)* and *Masuyama et al (US 6871934 B2)* in view of *Yamada et al. (US 6260940 B1)*.

Regarding Claim 3, *Kao* does not disclose wherein the number of elements in the group available to print is increased as a function of the distance traveled by the array.

Yamada discloses wherein a number of elements in a group of nozzles available to print is increased as a function of the distance traveled by the array (**Abstract and see Col 6, Row 50 – Col 7, Row 5, the concept of ramping up and down where an array of nozzles are traveling along a predetermined distance across a paper medium on which printing is to be performed and see Col 7, Rows 25-67, where heating of nozzles to a state of printing so that the number of nozzles available to printing is increased as a function of the distance traveled**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzles of *Kao* to increase the number of nozzles available to print as a function of distance traveled in order to avoid any potential time delay so that once the array arrived on the location, printing can immediately start (*Yamada, Col 7, Rows 18-23*).

Regarding Claim 9, *Kao* does not disclose wherein the array of printing elements extends substantially fully across the page in the first direction.

Yamada discloses wherein the array of printing elements extends substantially fully across the page in the first direction (**Col 7, Row 50 - Col 8, Row 5**).

It would've been well known to one of ordinary skill in the art at the time of the invention to implement the manner of printing of *Yamada* into *Kao* in order to properly print a page of image data, be it text or graphic.

Regarding Claim 13, *Kao* does not disclose wherein the elements are arranged to move relative to the image being printed and the number of elements in the subset of that group is increased in dependence upon the degree of movement between the elements and the image being printed.

Yamada discloses wherein the elements are arranged to move relative to the image being printed and the number of elements in the subset of that group is increased in dependence upon the degree of movement between the elements and the image being printed (**Abstract and see Col 6, Row 50 – Col 7, Row 5, the concept of ramping up and down where an array of nozzles are traveling along a predetermined distance across a paper medium on which printing is to be performed and see Col 7, Rows 25-67, where heating of nozzles to a state of printing so that the number of nozzles available to printing is increased as a function of the distance traveled**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzles of *Kao* to increase the number of nozzles available to print as a function of distance traveled in order to avoid any potential time delay so that once the array arrived on the location, printing can immediately start (***Yamada*, Col 7, Rows 18-23**).

Regarding Claim 17, *Kao* does not disclose wherein the plurality of printing elements forms a page wide or a page high array.

Yamada discloses wherein the plurality of printing elements forms a page wide (**Col 7, Row 50 - Col 8, Row 5**) or a page high array.

It would've been well known to one of ordinary skill in the art at the time of the invention to implement the manner of printing of *Yamada* into *Kao* in order to properly print a page of image data, be it text or graphic.

Regarding Claims 19 and 20, *Kao* remaining silent on a printer control circuit adapted to control a printer and a computer readable medium containing program instruction which, when executed by a data processing device, control a printer assuming one of ordinary skill in the art is enabled with the knowledge to do so.

Yamada discloses a printer control circuit adapted to control a printer (**Figs 2-3 and see Col 3, Row 65 – Col 4, Row 12**) and a computer readable medium containing program instruction which, when executed by a data processing device, control a printer according to claims 1-7, and 9-10 (**Col 4, Rows 55-65, ROM 33 stores the control program**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the control circuit and control program of *Yamada* to perform the functions of *Kao* in order to effectively control the operation of the entire printer from an integrated point of command in a cost effective manner.

7. Claims 8 and 19 are rejected under 35 USC 103(a) as being unpatentable over *Kao et al. (US 2002/0018086 A1)* and *Masuyama et al (US 6871934 B2)* in view of *Silverbrook (US 5864351 A)*.

Regarding Claim 8, *Kao* does not disclose wherein faulty printing elements, as identified by a faulty printing element database, are excluded from being made available to the group.

Silverbrook discloses wherein faulty printing elements, as identified by a faulty printing element database, are excluded from being made available to the group (**Col 27, Rows 11-44, Fault Map RAM 412, dynamically reconfiguring an available nozzle to replace a faulty nozzle so as to exclude the faulty nozzle from the active service group**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the system of ***Kao*** with the ability to dynamically reconfigure an active duty nozzle to replace a faulty nozzle as suggested by ***Silverbrook*** in order to extend the life of the nozzle array in a cost effective manner.

Regarding Claim 19, *Kao* remaining silent on a printer control circuit adapted to control a printer.

Silverbrook discloses a printer control circuit adapted to control a printer to perform the method claimed in claim 8 (**Fig 4 and see Col 26, Row 43 – Col 28, Row 50**).

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the control circuit of ***Silverbrook*** to perform the functions of ***Kao*** in order to effectively control the operation of the entire printer from an integrated point of command in a cost effective manner.

8. Claim 20 is rejected under 35 USC 103(a) as being unpatentable over ***Kao et al. (US 2002/0018086 A1)*** and ***Masuyama et al (US 6871934 B2)*** and ***Silverbrook (US 5864351 A)*** in view of ***Yamada et al. (US 6260940 B1)***.

Regarding Claim 20, *Kao* remaining silent on a computer readable medium containing program instruction which, when executed by a data processing device, control a printer assuming one of ordinary skill in the art is enabled with the knowledge to do so.

Yamada discloses a computer readable medium containing program instruction which, when executed by a data processing device, control a printer according to claim 8 **(Col 4, Rows 55-65, ROM 33 stores the control program).**

It would've been obvious to one of ordinary skill in the art at the time of the invention to modify the control circuit and control program of ***Yamada*** to perform the functions of ***Kao*** in order to effectively control the operation of the entire printer from an integrated point of command in a cost effective manner.

Conclusion

9. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 3/19/2008 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to

37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Richard Z. Zhu whose telephone number is 571-270-1587 or examiner's supervisor King Y. Poon whose telephone number is 571-272-7440. Examiner Richard Zhu can normally be reached on Monday through Thursday, 6:30 - 5:00.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RZ²
04/30/2008

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